

Multi-epoch precise photometry from the ground: MUDEHaR first year of observations

Holgado, G.¹, Maíz Apellániz, J.², Fariña, C.³,

¹ Instituto de Astrofísica de Canarias, IAC, Avenida Vía Láctea, E-38205 La Laguna, Tenerife, Spain

² Centro de Astrobiología (CAB), CSIC-INTA, Campus ESAC, C. Bajo del Castillo s/n, E-28692 Madrid, Spain

³ Instituto de Astrofísica de Andalucía, (CSIC), E-18 008 Granada, Spain

Abstract

MUDEHaR is a multi-epoch photometric survey with two narrow filters in H α and the calcium triplet window that uses T80Cam at the JAST80 telescope at Javalambre spanish astronomical observatory. It is obtaining 50 epochs/year per field for 20 fields in the Galactic disk, each of two square degrees, for a total of 40 square degrees. Focused on stellar clusters and HII regions including bright stars, it's main objective is to detect tens of thousands of stars that present emission/variability in H α on a days-months-years scale, including massive stars with a magnetic field, pulsating stars, and all other types of variable stars present in each field. MUDEHaR has completed its first of five years of project, and all the information is already available for exploitation. Observations from this first year will soon be available on the web. Here We present some of its singular characteristics such as its extensive dynamic range in magnitudes towards the brightest stars (AB mag 3-17 with S/N > 100); and a powerful resolution capability in the sky (0.55 arcsec/pix). We will also present how to access to the data and some useful tools for the treatment of MUDEHaR data. We will present the calibration and precision results from this first year of observations by comparing them with eclipsing stars and Cepheids that also have multi-epoch information from Gaia and the Zwicky Transient Facility (ZTF). The comparison shows excellent agreement, with very competitive uncertainties, and even improving the period determination for some binary systems.

My poster in zenodo.org can be found here